

## **Does Recent DVT and/or Pulmonary Embolus Preclude Complex Extremity Flap Reconstruction?**

**Ian L. Valerio, MD, MS, MBA; Reed Heckert, MD; Scott Tintle, MD; Jennifer Sabino, MD; Mark Fleming, DO; Anand Kumar, MD**

### **Abstract**

**Introduction:** Over the prior 10 years of our reconstructive surgery practice, a high volume of extremity reconstructions requiring flap coverage have been performed. Our poly-trauma cases often present with multi-extremity injuries, have high amputation rates, and are accompanied by pelvic and/or long-bone fractures with extensive soft tissue wounds. These patients have high Injury Severity Scores (ISS) with many independent risk factors for developing deep vein thromboses (DVTs) and pulmonary emboli (PEs). This study will determine the incidence of DVT/PE in our traumatic extremity cases that underwent flap procedures and will review the outcomes and complications within this high-risk cohort of patients.

**Methods:** A retrospective review of flap procedures for extremity injuries from 2003-2011 was completed. For those patients requiring flap coverage with known DVT/PE, therapeutic anticoagulation or IVC filters were provided per accepted guidelines or standards of care. Outcomes evaluated in the DVT/PE cohort included flap success rates, with complications such as partial/total flap failure, donor and/or recipient site hematomas, seromas, or wound healing issues assessed.

**Results:** A total of 137 extremity flap procedures were performed (76 pedicle; 61 free flaps), with 22 patients (16.1%) having radiographic evidence of preoperative DVT/PE (11 pedicle and 11 free flap cases, respectively). Upper extremity cases had an even higher rate of confirmed preoperative DVT/PE (22.4% of all extremity cases and 68.2% of DVT/PE cases). The ISS averaged 23.8 for the DVT/PE cohort (range 19-39). Anticoagulation therapy consisted predominantly of weight-based therapeutic LMWH in 15 cases (68.2%), IVC filter in 5 patients (22.7%), and heparin drip in 2 patients (8.9%). The average duration of anticoagulation therapy was 16 days (range 4-50days) prior to flap transfer. The most common complications were partial flap necrosis (4.5%) and hematoma (4.5%). There were no total flap failures, infections, or adverse outcomes related to progression of an existing DVT or PE in this series.

**Conclusion:** DVT/PE rate in our trauma patients was 16.1% for all cases requiring extremity flap coverage and 22.4% for those cases within the upper extremity flap cohort. Despite these preoperative thrombotic events and risks, flap transfers were performed with high success rates and relatively low complication rates. Pedicle and/or free flaps for extremity injuries can be considered safe to perform in carefully selected and treated patients with known preoperative DVT/PE.